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ABSTRACT

A study of coordination modes in work group communication was conducted to evaluate and expand leadership contingency models. A total of 106 people in classes and workshops on organizational communication completed seven questionnaires resulting in nine measures of six independent variables representing the following contingency factors from previous studies: leader position power, task structure, group atmosphere, work flow interdependence, group size, and group membership maturity. Since initial analyses of the data tended to replicate previous research, there was reason to believe that the measurement methods were reasonably valid and reliable. Further analyses correlated the data to previous research studies that proposed contingency and situational models of leadership communication. In general, the findings suggested the utility of perceiving formal and informal communication as relatively independent rather than as polar opposites arranged on a continuum. (RL)

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WORK GROUP COMMUNICATION MODES AND THE ASSESSMENT OF CONTINGENCY AND SITUATIONAL MODELS OF LEADERSHIP

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The time for contingency models has arrived. They exist in the field of leadership (Fiedler, 1967; Hunt and Larson, 1974; and Hersey and Blanchard, 1977). Furthermore, they are common in management (see Lawrence and Lorsch, 1969; Galbraith, 1973; and Lorsch and Morse, 1974). Work group coordination or communication has also been described in contingency terms (Van de Ven, Delbecq, and Koenig, 1976 and Tushman, 1979).

Two leadership models have received particularly high visibility and acceptance. Fielder's work was originally reported in 1967. A subsequent text, co-authored with Chemers, appeared in 1974, and currently, a version of the model is available in yet another edition (Fiedler and Chemers, 1976). The work has been controversial (see for example Schriesheim and Kerr, 1977). Fiedler posited three contingency variables: task structure, leader position power, and group atmosphere. His research work indicated a complex interrelationship between the three contingency variables and effective leader style. In brief, the data and a 1972 analysis (Fiedler, 1972) seemed to suggest that task oriented leaders were more effective in highly favorable or unfavorable conditions and person oriented leaders more effective in intermediate levels of favorableness. Favorableness was defined as a combination of high task structure, high leader power, and warm group atmosphere.

Hersey and Blanchard (1977) have proposed a model based on the managerial grid and using group member maturity as the single contingency variable. Hersey and Blanchard suggest that for very immature followers, the most effective leader style is highly task

oriented. For moderately immature members, a combination of task and person oriented leader style is best while a greater concentration on person orientation and reduced task orientation is best for moderately high maturity members. For very mature persons, the best leadership style is one of delegation, that is, low person and low task orientation. Hersey and Blanchard's book has been successful in terms of sales and is currently in its third edition. A careful reading indicates, however, relatively little empirical data to support or deny the member maturity model.

A seminal work in group coordination has been that of Van de Ven, Delbecq, and Loenig (1976) who studied work group coordination modes. Their research is based upon the earlier theoretical efforts of Thompson (1967). Van de Ven and his colleagues selected task uncertainty, work flow interdependence, and group size as variables to study. Their results indicated that the more formal and centralized modes of coordination such as the use of policies, procedures, schedules, plans, and supervisory control tended to increase as task structure increased and to decrease as structure decreased. Conversely, informal modes of coordination involving groups or one-to-one contacts between workers increased as structure decreased and vice versa. Thus, formal and informal modes of coordination are inversely related to one another in terms of task structure. The same did not hold for work flow interdependence. As interdependence increased, use of the informal modes increased but use of formal modes did not decrease greatly. The two kinds of coordination are not inversely related in terms of work flow. There was, in fact, an increase in overall use of communication

modes. High interdependence implies a great need for communication of all types. Finally, group size had a relatively small effect, mainly restricted to a small increase in the use of formal methods as size increased. Thus, Van de Ven, Delbecq, and Koenig showed that there existed a rather complex set of relationships between task structure, work flow interdependence, and group size and the use of formal and informal communication modes.

The research on work group coordination modes suggested a technique for simultaneously testing both the Fiedler's and Hersey and Blanchard's leadership contingency models. In addition, correlational and multiple regression analyses could be performed on six contingency variables at once: task structure, leader power, group atmosphere, work flow, group size, and member maturity.

The key assumption which had to be made was that the most effective leader style would match the predominant modes of communication in the work group. Based on prior research, as an example, an increase in task structure is associated with an increase in the use of formal, centralized communication modes such as written rules and procedures, plans and schedules, and conventional supervisory control over employees. This should be associated with relatively task or goal oriented leadership behavior by the group leader. Conversely, a task with low structure is usually associated with communication involving one-to-one contacts between group members and the use of staff meetings, committees, and problem solving groups. The leader should possess qualities which facilitate interpersonal and group communication between group members, qualities usually associated with the person or relationship

oriented leadership style. Coordination mode ought to be matched by the leadership style. Lorsch and Morsel (1974) showed that members' cognitive complexity, tolerance for ambiguity, attitude toward authority, and attitude toward individualism matched the uncertainty of the environment of the organization. Thus, a study of coordination modes ought to permit additional insights into the leadership contingency models.

The overall logic of the study was relatively straightforward. The first step was to replicate the Van de Ven, Delbecq, and Koenig study using questionnaire data to compare to their combination of questionnaire and direct observational data. If the replication worked, then the questionnaire data could be taken to be valid. Using the same data, the three contingency variables from Fielder and the one from Hersey and Blanchard could be used to analyze the data and plot graphs or charts equivalent to those in the original works. Presumably, the findings should match. Finally, all six of the contingency variables, combined from three different sources, could be used in correlational and regression analysis to develop a more complete contingency model.

Procedures

An availability sample obtained from classes and workshops in organizational communication was used. Types of organizations represented in the sample include social service agencies, hospitals, restaurants, financial institutions, industrial plants, small businesses, schools, and governmental units. A total of 106 persons completed

seven questionnaires resulting in nine measures. There were six independent variables representing contingency factors from previous studies: leader position power, task structure, and group atmosphere from Fiedler (1967), task structure, work flow interdependence, and group size from Van de Ven, Delbecq, and Koenig (1976), and member maturity from Hersey and Blanchard (1977). All data were perceptual, based upon questionnaire responses.

Of the measures from Fiedler, the scales on group atmosphere were used without revision. Statistical analysis show a split half reliability of 0.89. Fiedler's task structure measure was derived from expert judgments of group tasks. In the present study, a set questionnaire consisting of eight items was adopted from the study by Van de Ven, Delbecq, and Koenig (1976). The items measured a combination of task uncertainty and task variability in the work group. A split half reliability of 0.36 was obtained. However, in the original study a reliability of .92 was obtained. In addition a correlation of .84 resulted from a comparison of the perceptual results to expert judgments of task uncertainty. To measure leader position power, the checklist items provided by Fiedler were changed so that the respondent assessed the degree to which the group supervisor was likely to exert the various forms of direct control or evaluation. The split half reliability was 0.60.

Work flow interdependence was measured using the methods of Van de Ven, Delbecq, and Koenig. However, a change was made in data analysis. Van de Ven and his colleagues gave each form of interdependence a scale value. In the present study, respondents indicated

the extent, as a percentage, to which each form of work flow occurred in the group, and the percentage values were used in subsequent analyses. Group size was based on reports on the number of full time and part time personnel in the group. Part time personnel were counted as equal to full time on the rationale that each individual represented a need for coordination whether working full or part time.

No member maturity instrument was available. Therefore, a questionnaire was devised based upon Hersey and Blanchard's discussions of maturity as a combination of motivation (willingness) and competence (ability). Aiken and Hage (1968) had used a measure of professional activity which correlated with certain organizational communication measures. The member maturity instrument was designed to include some items of this type which since professionalism seemed related to motivation and competence. The resulting questionnaire provided a split half reliability of 0.63 and factor analysis showed a single factor among the five items.

The dependent variables were defined as the use of formal communication modes, the use of informal communication modes, and total use of communication modes. These measures were obtained from a questionnaire employed by Van de Ven and his colleagues which consisted of nine items: use of rules and policies, use of plans and schedules, use of a supervisor, use of an assistant supervisor, use of an informal work coordinator, use of staff meetings, use of standing committees, use of temporary (ad hoc, task force) groups, and use of one-to-one personal contacts to coordinate work. The item

on an informal work coordinator was deleted because it was inapplicable to over 90 percent of the person responding to the questionnaire. The value for formal communication used in this study was obtained by summing the response for rules and policies, plans and schedules, supervisor, and assistant supervisor as a measure of formal, centralized, hierarchical, and goal and task oriented modes of communication. Informal, decentralized, participative, and relationship and person oriented modes of communication were taken to be the sum of the use of staff meetings, standing committees, temporary groups, and one-to-one contacts. The total communication modes score was the sum of the formal and informal scores. Table 1 summarizes the characteristics of the variables as measured in this study including reliabilities, variances, skewnesses, and other information.

The nature of the dependent variables are particularly important in this study. Therefore, a correlational and factor analysis was performed of the nine items representing communication or coordination modes. The matrix of first order correlations is shown in Table 2. Only correlations significant at the .05 level or less are shown. The factor analysis showed that four items (policies and procedures, plans and schedules. supervisor, and assistant supervisor) formed a factor which is represented in this study as the dependent variable "formal communication modes." A second factor consisted of the three "group" modes of coordination (staff meetings, standing committees, and temporary groups). The third factor was composed of one-to-one coordination plus the use of an informal coordinator, however these two items were negatively correlated with one another. As noted

previously, the item on an informal work coordinator proved troublesome to many people completing the questionnaire, so it was dropped from further consideration. The dependent variable "informal communication modes" consisted, then, of the three items in the second factor plus the use of one-to-one contacts.

Finally, the two dependent measures were correlated with one another resulting in a coefficient of 0.29, significant at the .05 level. This indicated that the two dependent variables, formal and informal communication, were moderately positively correlated with another so that more formal or informal communication would be associated with more of the other. This finding replicates data from other sources (Hage, 1974) which tend to show that increases in one mode of communication are usually associated with increases in other modes, written versus oral as an example. Table 2 shows the independent and dependent variables and their characteristics.

A Replication of the Van de Ven, Delbecq, and Koenig Study

Van de Ven, Delbecq, and Koenig studied modes of coordination (or communication) in work groups using three contingency variables: task uncertainty, work flow interdependence, and group size. Their work followed from the theoretical and empirical work of Blau, 1968; Thompson, 1967; Meyer, 1972; Hage, 1974; and Heydebrand, 1973 on methods of managerial coordination at the organizational level. Van de Ven and his colleagues applied the same sort of reasoning to work groups. In addition, they focused on processes of coordination rather than work group structures. This followed from the theoretical

insights of March and Simon (1958) and Thompson (1967).

The three variables measured by Van de Ven, Delbecq, and Koenig were used in the present study. Task uncertainty and work flow interdependence were measured in essentially the same way as in the original study. A different index of interdependence was used as noted previously. Group size was measured perceptually, through a questionnaire, rather than from organizational data.

Since the purpose of this study was to explore leadership requirements and modes, the coordination mode data were collapsed into two types: impersonal and personal. Graphs were plotted accordingly. This required collapsing the various indices from the Van de Ven, Delbecq, and Koenig article's graphs to make comparison possible. The results, for task uncertainty, are shown in Figure 2[1]. Essentially, the findings are quite similar. Informal modes increase and formal modes decrease with decreases in task structure and increases in task uncertainty. The comparison was made by dividing the groups into thirds based on task structure scores from the questionnaire and then computing the mean responses for the impersonal and personal coordination modes. The major difference between the original study and this replication seem to be in the relatively greater use of personal modes of coordination in relatively high task structure situations. This could very well be the result of a possible sampling bias in the present study in which work groups with relatively low structure and high use of informal modes might be over-represented. These would be groups in education, social services, and health care.

The comparisons for work flow are shown in Figure 2. Again, the general trends of the original study are confirmed, the only difference occurring in the upward shift of formal modes for team work flow in the present study. Note that this occurs for the condition with the smallest sample, only 13 groups. Perhaps a larger sample would reduce the dramatic upward trend.

In general, increases in work flow interdependence seem to be associated with increasing use of personal modes of coordination. There is an increase in the use of formal modes from the independent to sequential flow conditions and then a decrease from sequential to reciprocal flow. Overall there is reasonable correspondence between the data from the original study and the present research.

The final comparison is based on work group size, and the results are shown in Figure 3. There is a tendency toward an increased use of formal coordination from the independent and sequential flows to the reciprocal and team flows. This fits the general shape of the line from the original research. The use of personal modes increases with the increase from 5-7 persons up to 8-10 and then decreases for the larger groups of 11 or more persons. The original research tended to show a gradual decline in personal modes above a size of 5-7. In both cases, however, the changes are small and somewhat erratic. Group size does not seem to be a major factor in determining coordination modes in work groups.

There was general agreement between the present findings and the data reported by Van de Ven Delbecq, and Koenig. Both studies provided support for the assertion that increasing task uncertainty or decreasing

task structure results in a substitution of personal for impersonal modes of coordination (Van de Ven, Delbecq, and Koenig, 1976, 329). Both studies also supported the notion that increasing work flow interdependence results in an additive effect on coordination: there is more total coordination for reciprocal and team work flows (Van de Ven, Delbecq, and Koenig, 1976, 330). Finally, the studies provided ombiguous evidence on group size.

Since the findings of the present study tended to replicate the original Van de Ven, Delbecq, and Koenig results, there was reason to believe that the measurement methods are reasonably valid and reliable. No major descrepancies occurred. Overall trends were confirmed. Some confidence could be placed in the data on task structure, work flow interdependence, impersonal modes of coordination, and personal modes of coordination.

An Assessment of Fiedler's Contingency Model

The three contingency factors in Fiedler's research-leader-member relations, task structure, and leader position power were measured using ratings by one person from each of the job work groups. The median value for each contingency variable was computed and each group was then placed into one of two categories on each variable: good leader-member relations or poor, high or low task structure, and high or low leader power. As a result, there were eight possible combinations, exactly equivalent to the eight sectors in Fiedler's contingency model (1974, 70).

The dependent or predicted variable, in this study, was not

leader effectiveness but rather the mode of coordination employed in the work groups. Two scores could be obtained for each contingency condition, one related to "task oriented" coordination modes and the other to the more "person oriented" modes. Note that this is a difference from Fiedler. The nature of the LPC instrument used by Fiedler makes a leader either task or person oriented. In the present study, a work group could require either task or person oriented skills or some combination of the two.

Fiedler's original data and subsequent validation studies (Fiedler and Chemers, 1974, 84) suggested the following hypotheses for this study:

H1: Under conditions of good leader-member relations, a structured task, and strong leader position power, there ought to be relatively high use of task oriented and relatively low use of person-oriented coordination modes.

H2: Under conditions of good leader-member relations, a structured task, and weak leader position power, there ought to be relatively high to neutral use of task oriented and low to neutral use of person oriented coordination modes.

H3: Under conditions of good leader-member relations, an unstructured task, and strong leader position power, there ought to be relatively high use of task oriented and low use of person oriented coordination modes.

H4: Under conditions of good leader-member relations, an unstructured task, and weak leader position power, there ought to be relatively high use of person oriented and low use of task oriented coordination modes.

H5: Under conditions of poor leader-member relations, a structured task, and strong leader position power, there ought to be relatively high use of person oriented and low use of task oriented coordination modes.

H6: Under conditions of poor leader-member relations, a structured task, and weak leader position power, there ought to be relatively high use of person oriented and low use of task oriented coordination modes.

H7: Under conditions of poor leader-member relations, an unstructured task, and strong leader position power, there ought to be relatively high use of person oriented and low use of task oriented coordination modes.

H8: Under conditions of poor leader-member relations, an unstructured task, and weak leader position power, there ought to be relatively high use of task oriented and low use of person oriented coordination modes.

These hypotheses are simply a verbal statement of the points on the graph published by Fiedler and Chemers (1974, 84).

The findings of the present study are shown in Figure 4 together with the original contingency model line from Fiedler's data (not including the validation results reported later by Fiedler and Chemers). To simplify analysis and presentation, the use of task and person oriented coordination modes is reported as deviation from the grand mean for each condition. Thus, for the first set of contingency factors, task oriented modes were used +0.74 scale units more frequently than the grand mean while person oriented modes were used +2.66 units more frequently than for all conditions combined. In other words, there was slightly greater use of task oriented and much greater use of person oriented modes under these conditions than for all conditions combined. The hypothesis predicted relatively high use of task oriented modes and low use of person oriented modes. Thus, H1 was not supported by the plotted data.

For H2, the prediction, again, was for high use of task oriented and low use of person oriented coordination modes. Questionnaire results showed a slightly higher use of person oriented modes and a much reduced use of task oriented modes under these conditions. H2 was not supported in a graphic comparison.

A major difference in the measurements between this study and using LPC is highlighted here. With LPC, there is either task or person orientation. With the coordination mode questionnaires, there can be high or low use of task modes and high or low use of person modes. A low use of task modes is not, however, the same as high use of person

modes. The two modes are not related in a simple inverse fashion as shown earlier.

For H3, the prediction was for use of task oriented modes. The data showed a slightly greater use of task oriented modes than for all conditions combined but, at the same time, a much greater use of person oriented modes. H3 was supported in the graph.

The next three hypotheses - H4, H5, and H6, all predicted a high use of person oriented modes and low use of task oriented modes. There was a moderate use of person oriented modes and moderate use of task oriented modes for a partial confirmation of hypothesis H4. H5 and H6 were not supported by graphic evidence. In both of these conditions, there was high use of task oriented coordination modes and low use of person oriented modes.

The results for H7 are equvocal. There was relatively high use of both task and person oriented modes, falling on both sides of the point plotted by Fiedler and the predictions in the hypothesis. There was partial support.

For H8, the results were in the opposite direction of those predicted. Very low use of task oriented modes was combined with moderately low use of person oriented modes. H8 was not supported.

In general, six hypotheses were rejected. All of these were the hypotheses generated from the conditions where Fiedler's data are the strongest in the sense of departing from a zero-line conditions. Partial and equivocal findings were obtained from the two conditions where Fiedler's data were also the most equivocal.

Looking at the overall shape of the curves in Figure 4 suggested

that the present findings, in fact, constituted almost a mirror image of the original Fiedler findings. A comparison was attempted. If the task and person oriented coordination mode scores are compared to get a "net effect score" by appropriate subtraction processes, a single line can be plotted which represents the closest approximation of the present data to the LPC-based data obtained by Fiedler. The results are shown in Figure 5 which illustrates the inverse nature of the present data compared to that of Fiedler, if high LPC is taken to represent person oriented motivation and low LPC, task orientation.

Stepwise linear regression analysis was used to obtain some insight into the nature of the effects. These data are shown in Table 3. Formal or task oriented communication modes are related mainly to the leader power measure and secondarily to task structure. The greater the leader power and task structure, the greater the use of formal communication modes. For informal or person oriented modes, group atmosphere is the best predictor while low task structure adds some additional predictive power. Leader power seems not to influence person oriented communication modes. When the two modes are combined into a total score, the combination of leader power and group atmosphere are the best predictors. Note that task structure could not predict total communication since it is inversely related to the two scores which make up the total.

To summarize these correlational findings, formal communication modes are related to high leader power and high task structure while informal modes are related to a positive group atmosphere and low task structure. The combination of both modes occurs when there is

a positive group atmosphere and high leader power, a condition in which there seems to be more formal communication and, at the same time, more informal communication.

The relationships between task structure, group atmosphere, and leader power are complex, and the use of formal or informal modes of communication cannot be predicted on any simple basis. A note of caution is also needed. The measurements of leader power and of formal communication modes may be spuriously correlated to some extent. Formal modes include the use of supervisor or assistant supervisor modes of communication which ought to be related to supervisor power in the group. Thus, the two questionnaires may have measured some of the same features in a group. To the extent that this is true, the model can be simplified somewhat. High task structure tends to be related to high use of formal modes while a positive group atmosphere and low task structure is related to high use of informal modes. Since task structure is related positively in one case and negatively in the other, there is a zero net effect on total communication and group atmosphere tends to determine the total use of the various communication modes.

More will be said about the issues of spurious correlation between leader power and formal modes of communication in a later section.

An Assessment of the Hersey-Blanchard Situational Model

Hersey and Blanchard (1977) proposed a situational model of leadership based on the notion of a grid model of leadership styles

and skills and member maturity as the contingency or situational variable. A grid model requires that task and person orientations be considered independent dimensions such that any individual leader can be task oriented, person oriented, both task and person oriented, or neither. The best known grid model is that of Blake and Mouton (1964) but the greatest empirical support for the model is from the work of the Ohio State group (Stogdill, 1963; Hemphill and Coons, 1957; Helpin and Winer, 1957).

Member maturity, according to Hersey and Blanchard, is a combination of two factors: the kind and level of motivation and competence. In general, maturity increases as the subordinates' self motivation and task relevant competence increases. Hersey and Blanchard talk in terms of willingness and ability to perform, and they create a four way classification: unwilling and unable, willing but unable, unwilling but able, and willing and able to perform as increasing levels of maturity. In practice, however, they define four levels of maturity as simply increasing from immature to mature without reference to any actual measurement of motivation or competence.

The contingency works in this way: for very immature subordinates, task oriented leadership is most appropriate; for moderate immaturity a combined task and person oriented leadership style is best (Blake and Mouton's 9,9 manager); and for moderate maturity, a person oriented style is best. The major difference between Hersey and Blanchard and most other theorists is their insistence that a

combination of low task and low person orientation is effective under certain conditions, that is, with very high maturity followers.

Both task and person orientations in terms of coordination modes were measured in the present study. These modes ought to relate, consistently, with member maturity if Hersey and Blanchard are right. The following hypotheses were generated from the information contained in Hersey and Blanchard's book:

Hypotheses:

1 The use of personal coordination modes ought to increase from the low to moderate low member maturity condition.

2 The use of personal coordination modes ought to increase from the moderate low to the moderate high member maturity conditions.

3 The use of personal coordination modes ought to decrease from the moderate high to the high member maturity condition.

4 The use of impersonal coordination modes ought to remain constant or decrease from the low to moderate low maturity condition.

5 The use of impersonal coordination modes ought to decrease from the moderate low to the moderate high member maturity conditions.

6 The use of impersonal coordination modes ought to decrease from the moderate high to the high member maturity conditions.

7 The use of combined personal and impersonal coordination modes ought to increase or remain constant from the low to moderate low member maturity conditions.

8 The use of combined personal and impersonal coordination modes ought to decrease from the moderate low to the moderate high member maturity conditions.

9 The use of combined personal and impersonal coordination modes ought to decrease from the moderate high to high member maturity conditions.

These nine hypotheses represent the relationships between task and person orientation and member maturity in the Hersey and Blanchard model.

The data on the 106 groups were also used to test the Hersey and Blanchard model. Scores on the member maturity questionnaire were tabulated and quartiles computed. The quartile values were then rounded to the nearest whole figure and groups assigned to high, moderate high, moderate low, and low member maturity. There were 23, 33, 27, and 23 groups in the four categories for a total of 106 groups.

The mean scores for impersonal and personal coordination scores were then computed for each of the four kinds of groups. The results are graphed in Figure 6. In general, the use of personal coordination modes increased with member maturity, the largest change occurring between moderate low and moderate high maturity groups. Impersonal coordination modes did not increase or decrease consistently for the four conditions. Total coordination, the sume of the two, increased steadily from low to high member maturity. This is due, of course, to the increase in the use of personal coordination while impersonal coordination remains constant. These findings suggest as additive model of leadership requirements in which person oriented skills are added to a relatively constant need for task oriented modes of coordination and skills.

In terms of the hypotheses listed earlier, the findings tended to support the increase in the use of personal modes of coordination from the low to moderate immature conditions and from moderate

immature to moderate mature. Further, the prediction that impersonal coordination modes would decrease from the moderate immature to moderate mature condition was also supported. The decrease in the use of impersonal coordination modes from the immature to moderate immature and from the moderate mature to mature conditions did not occur. The same was true for the predicted decrease in use of personal modes from the moderate mature to mature conditions. Thus, three hypotheses seemed to be confirmed and three rejected based on this evidence.

The combined use of task and person styles or modes should have peaked out in the moderate immature conditions according to Hersey and Blanchard with less use of such modes in the immature, moderate mature, and mature conditions. The increase from immature to moderate immature was supported; the other predictions were not. Total use of coordination, the combination of formal and informal modes, increased steadily with increases in maturity.

Overall then, four hypotheses were accepted and five rejected based on this graphic evidence. The Hersey and Blanchard predictions were not very well supported.

Correlational analysis provides some statistical support for the graphic interpretations. Member maturity and the use of informal modes of communication resulted in a Pearson r of 0.36, significant at the .01 level. The correlation with total communication was 0.25, also significant at the .01 level. The relationship between member maturity and formal modes of communication, however, resulted in a

correlation of only 0.09, not significant at the .05 level. These statistical findings suggest that member maturity is related to the use of informal modes of communication but not to formal modes. The two modes seem to be additive to the extent that there is also a positive correlation with total communication in the work group.

These data suggest a revision to the Hersey and Blanchard position, which was written prescriptively, not descriptively. While it might be desirable to reduce the use of task oriented, impersonal coordination modes as member maturity increases, it may not be possible. Intervening variables such as task structure, group size, work flow independence, and similar factors may limit the ability of the supervisor or manager to minimize the standard task oriented forms of coordination. Furthermore, it may not be possible as a result of organizational demands and norms. Written policies and procedures, schedules and plans, and supervisory control may be required by the overarching organization within which the work group functions. Thus, impersonal modes of coordination seem to stay relatively constant across all conditions of member maturity while the use of personal modes increases as maturity increases.

The data tended to support the Hersey and Blanchard model insofar as person oriented styles are related to increased member maturity. However, the data also support the managerial grid model in the sense that with high maturity members a combination of impersonal and personal coordination modes and therefore of task and person oriented leadership skills are required.

A Multiple Regressions Analysis of Six Contingency Variables and Work Group Communication Modes

Out of Fiedler's research program, Hersey and Blanchard's writing, and Van de Ven's research study, six contingency variables were defined: task structure, work flow interdependence, group size, member maturity, group atmosphere, and leader position power. These variables were regressed against formal, informal, and total communication modes for the entire sample of 106 respondents. The results are summarized in Table 4.

Leader position power and task structure both correlate with formal communication mode usage at levels of .05 significance. In addition, the regression coefficient values for these two variables are statistically significant at the same level. The multiple R for all six variables against formal communication modes was 0.40.

In the use of informal communication modes, work flow interdependence, group atmosphere, and member maturity provide correlations significant at the 0.05 level or better, and the regression coefficients for work flow and member maturity are significant at the .01 level. Multiple R was 0.44.

For total communication modes, summing the use of formal and informal modes, leader power, work flow, group size, and member maturity provide significant correlations; however, only leader power and work flow result in regression coefficients of significance. The multiple R was 0.49.

Naturally, some of the independent variables are correlated among themselves. These correlations are shown in Table 5. Note that member maturity provides the only significant correlations with other variables, giving values of -0.37, 0.22, and 0.39 with task structure, work flow interdependence, and group atmosphere respectively. The results can be interpreted more easily by showing the relationships between variables in graphic form as shown in Figure 7. The cluster of member maturity, work flow, and group atmosphere, are positively correlated with one another, while task structure, negatively correlated with member maturity, appears in all three diagrams. Leader position power is added to the cluster to provide the complete diagram for relationships with formal communication modes. Group size, although not correlated at a significant level, provides the next largest increase in multiple R in the regression analysis, probably because it is independent of the cluster of variables around task structure. Together, leader power, group size, and task structure give a multiple R of 0.36. In predicting the use of informal communication modes, work flow, group atmosphere, and member maturity alone result in a multiple R of 0.44. Task structure, leader power, and group size add almost nothing to the prediction. When predicting the total use of the communication modes, work flow, group atmosphere, leader power, and group size result in a multiple R of 0.46, thus providing most of the predictive capability. Task structure, rather obviously, is not a good predictor of total communication modes since it is directly related to one component, formal communication, and inversely related to the other, informal communication. Task structure, therefore, "cancels itself out" as a predictor of total communication.

Member maturity does not add much to the multiple R because of the high correlations with work flow and group atmosphere.

These results provide some insights into the use of formal and informal communication modes in work groups. The two modes are not mutually exclussive; they do not substitute for one another. Rather, they seem to be additive since there is a significant positive correlation between them. Different factors influence the two kinds of communication, and therefore, presumably the kinds of appropriate leadership styles. High position power coupled with a structured task points to high use of formal modes. Informal communication is related to high member maturity and work flow interdependence. In predicting high overal communication mode usage, a combination of high leader power and interdependent work flow is the best combination; however, positive group atmosphere, large group size, and high member maturity also contribute.

Thus, the relationships between the contingency variables used in prior theory and research is quite complex and not related to leadership styles in any simple fashion. A problem does exist in the data which needs to be addressed. As noted previously, two of the independent variables, leader position power and work flow interdependence, may represent measures which are almost equivalent to some aspects of formal and informal communication modes, respectively. Specifically, leader position power, as defined by Fiedler and operationalized in the questionnaire in this study, would be expected to be very highly correlated if not equivalent to high use of the supervisor or an assistant supervisor in coordinating

work. The communication mode would be very silimar to the position power by virtue of the operationalizations of the two variables. This represents tautological prediction: supervisory power predicts supervisory control. Similarly, high work flow interdependence was defined, in the questionnaire, in terms of face-to-face meetings of a team to exchange work. Three of the items which measure informal communication consist of questions about staff meetings, standing committees, and task forces, all of which represent face-to-face meetings of people. These two variables represent a tautological prediction also.

As a result of the spurious correlations between independent and dependent variables, a second analysis was run. Both leader position power and work flow interdependence were eliminated, and regression analyses run with the remaining four variables. The results are shown in Table 6. Formal communication mode usages is now predicted only by task structure at a significant level, and the multiple R drops from 0.40 to 0.28. For informal communication modes, the best predictors are member maturity and group atmosphere although only the regression coefficient for member maturity was significant. The multiple R dropped from 0.44 to 0.38. Total communication in the work groups was significantly correlated with work flow interdependence, member maturity, and group size; however, all three of the regression coefficients were significant at the 0.10 level but not the 0.05 level. An interesting feature of the prediction of formal communication modes is that member maturity provides the next greatest degree of increase in multiple R, raising the r for task structure and formal modes, 0.19, to a multiple R of 0.26.

This second analysis points to the need to measure task structure, group atmosphere, group size, and member maturity in order to make predictions about formal, informal, and total communication mode usage. Task structure and member maturity predict formal modes while member maturity and group atmosphere predict informal modes. Group size is effective in predicting total communication in the work group.

Discussion

At least six different contingency variables affect the use of various modes of communication in work groups. To the extent that the communication modes are indicative of the prevalent or needed leadership style in the group, the six variables also affect leadership. The contingency variables used in the models of Fiedler and Hersey and Blanchard affect communication mode utilization. In the case of Fiedler's model, the communication modes seem to be related inversely to the leadership styles proposed in Fiedler's 1974 work. Generally, the effect of Hersey and Blanchard's member maturity is as they predict for the use of personal, informal leadership modes.

Fiedler's 1974 intepretation of his findings assumed that LPC was related, through motivational factors, to leadership styles. The argument was that a person highly motivated by task achievement would find a least preferred coworker quite frustrating and thus rate the person lower than would a leader who was more person oriented. Subsequently, Fiedler has interpreted LPC as a cognitive complexity measure. However, more recent research indicates that

it is not consistently related to any other measure of cognitive complexity (Beamon and Koenig, 1974). LPC seems to be a totally unique measure. It is the ability of a person to assign relatively positive values to certain aspects of a least preferred coworker. Taking this to be the meaning of the LPC score, it can be related to communication modes using the present study. The result seems to be that low LPC leaders function most effectively as leaders in work groups where there is relatively high use of personal, informal communication modes. Conversely, high LPC leaders are more effective in conditions where there is more use of impersonal and formal communication. It may be that the leader's ability to positively value a person selected as "least preferred" is most useful where a combination of coordination by the leader is combined with written procedures, policies, rules and schedules. Such conditions tend to constitute communication centralized around the leader.

Leader behaviors are less important, in terms of direct influence, when the communication modes are primarily personal and informal. These modes involve one-to-one and group modes of coordination, in effect, delegating the coordination function to the group members. It may be, and this is purely speculation, that low LPC persons are more willing to delegate or abdicate under these conditions and thus are more effective. That would seem to be one explanation for low LPC leaders actually being more effective in these conditions.

While Fedler's model requires a rather major re-interpretation based on these data, Hersey and Blanchard hit somewhat closer to the

mark. Member maturity clearly does affect the use of informal, personal communication mod and; by extention, the utility of person oriented leadership behaviors. The effect on impersonal, formal modes is much less, perhaps because real work groups do not permit any major reduction in the use of formal communication modes as a result of requirements imposed by factors beyond those in the work group. The overarching organizational norms or else legal requirements may impose the need for formal communication.

In general, these findings suggest the utility of looking, at least, at two modes of communication, formal and informal, as relatively independent rather than as polar opposites arranged on a continuum. The number of variables which influence communication modes goes well beyond Hersey and Blanchard's single variable or even Fiedler's three. As many as six factors can influence work group coordination and communication. Two of the variables might be indirect measures of leadership mode and probably should be eliminated from further consideration. The remaining four variables affect both personal and impersonal communication modes and do so in different combinations and ways. Task structure is directly related to formal communication and inversely to informal modes. Group size is moderately and directly related to formal modes. Group atmosphere and member maturity are directly related to the use of informal modes. Overall, the contingency variables correlate more highly with informal than formal modes, using multiple R's as measures. This suggests that informal modes may vary more across work groups while formal may be

more consistent. Finally, the two modes are slightly correlated with one another and seem to be additive rather than substitutive. A group may use such combinations as high formal and high informal, high formal and low informal, or high informal and low formal. Future research studies need to investigate, at a minimum, the two modes of coordination or styles of leadership as they relate to task structure, group size, member maturity, and group atmosphere plus those other variables which might affect communication and leadership. Simplistic contingency or situational models must be avoided in the search for more effective leadership in education, business, government, and wherever persons work together toward a common goal.

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Figure 1

Comparison of the Present Study and Van de Ven's
Study Using Task Structure as a Contingency Variable

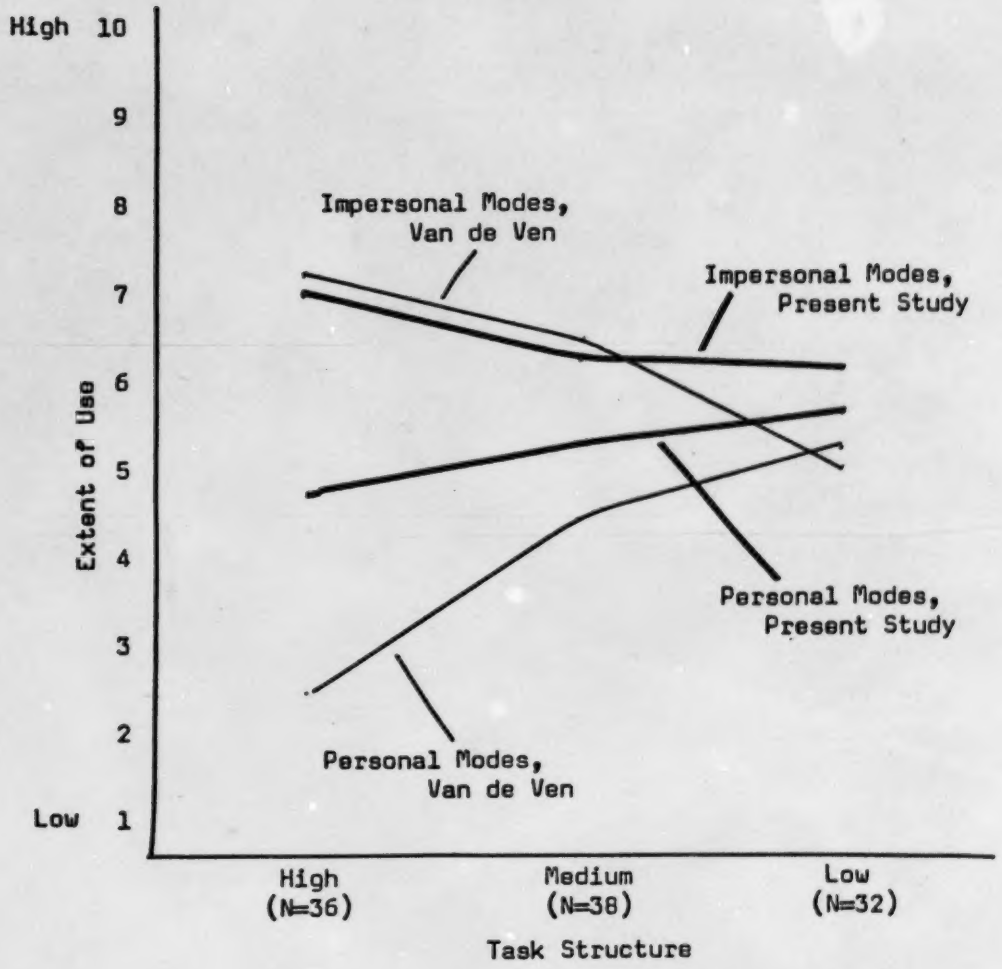

High 10
9
8
7
6
5
4
3
2
Low 1
Extent of Use
Impersonal Modes,
Van de Ven
Impersonal Modes,
Present Study
Personal Modes,
Present Study
Personal Modes,
Van de Ven
High
(N=36)
Medium
(N=38)
Low
(N=32)
Task Structure

Figure 2

Comparison of the Present Study and Van de Ven's Study Using Work Flow Interdependence as a Contingency Variable

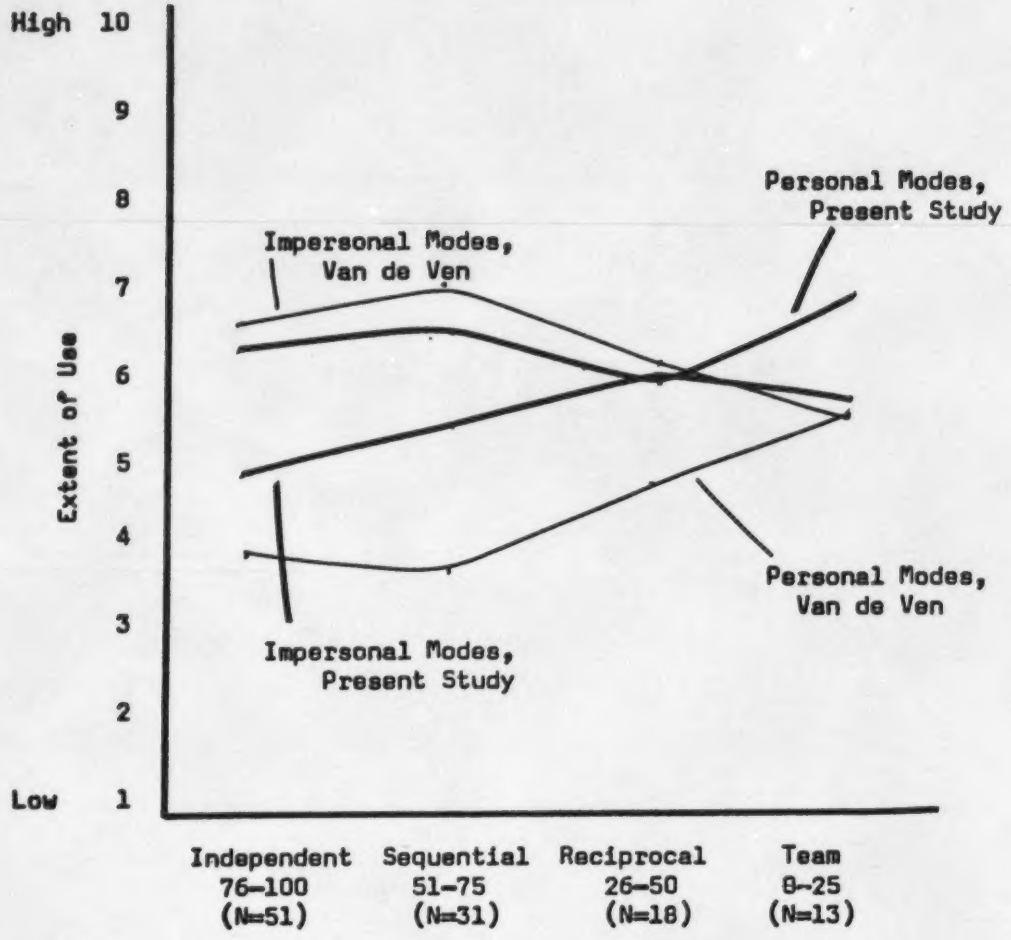

High
10
9
8
7
6
5
4
3
2
Low
1
Extent of Use
Impersonal Modes,
Van de Ven
Personal Modes,
Present Study
Personal Modes,
Van de Ven
Impersonal Modes,
Present Study
Independent
76–100
(N=51)
Sequential
51–75
(N=31)
Reciprocal
26–50
(N=18)
Team
0–25
(N=13)
Work Flow Interdependence
(Predominant Mode)

Figure 3

Comparison of the Present Study and Van de Ven's Study Using Group Size as a Contingency Variable

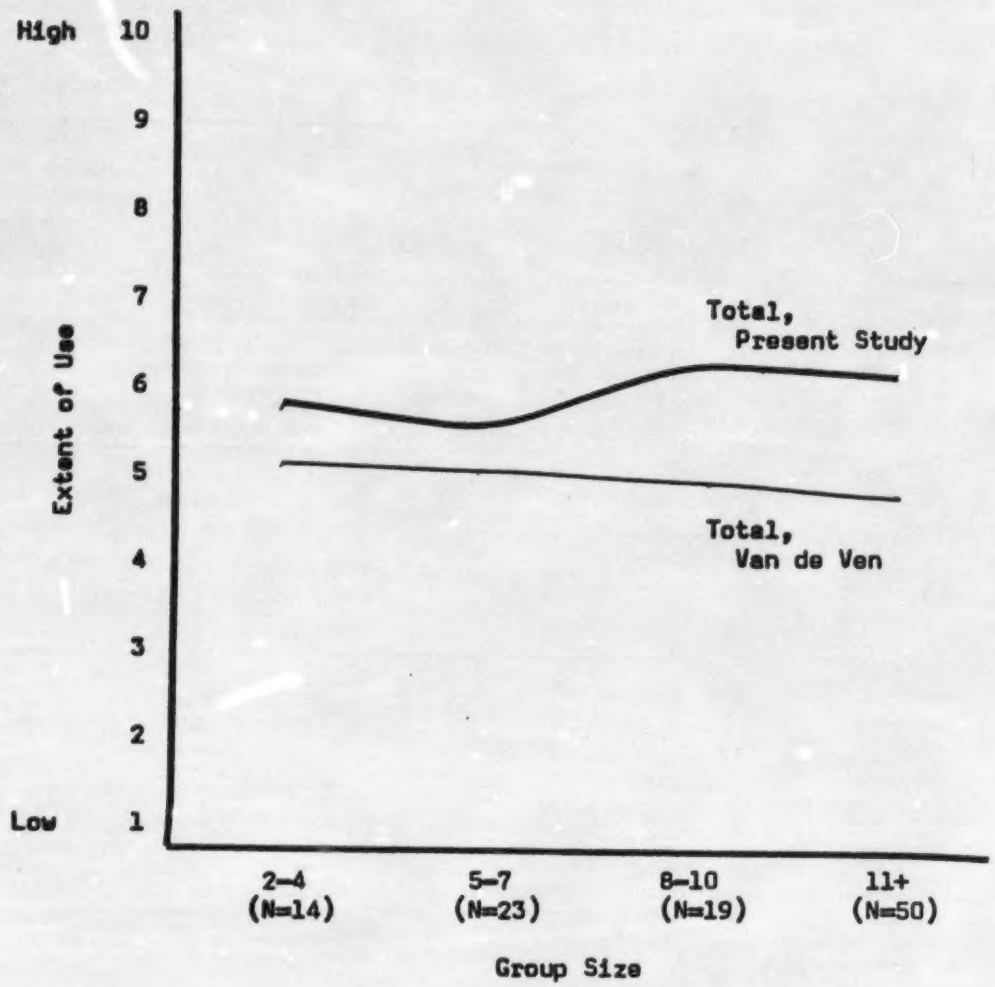
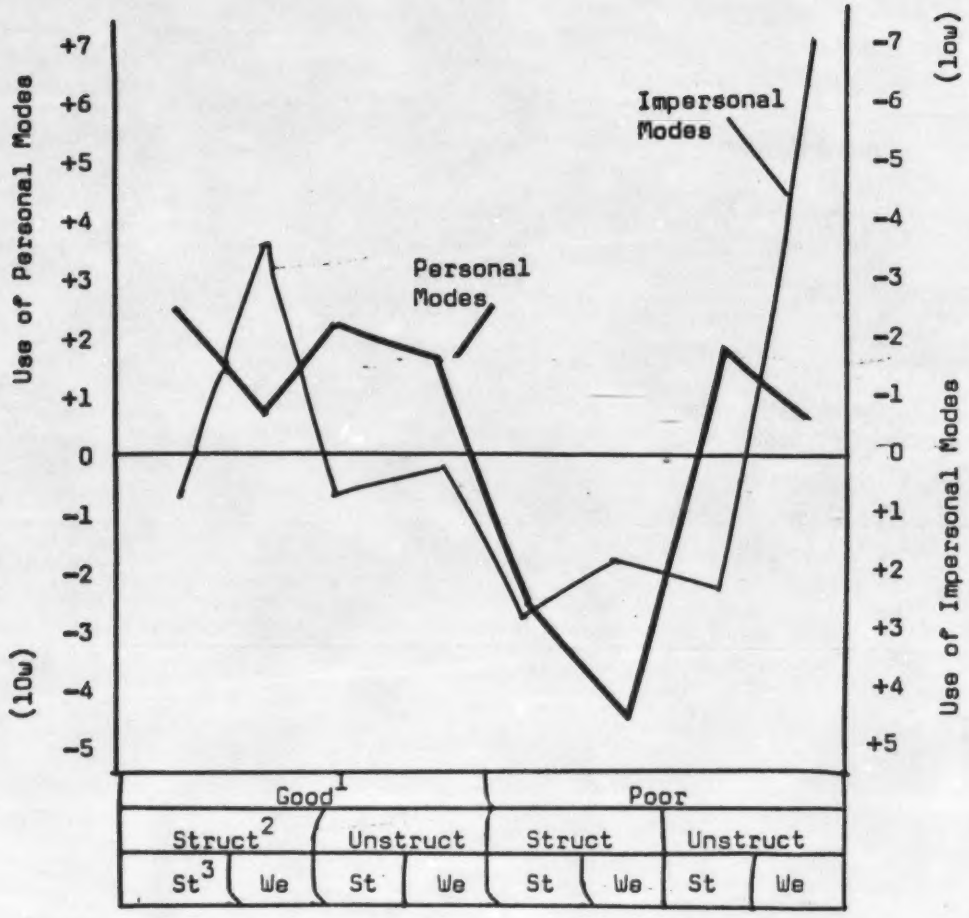

High
10
9
8
7
6
5
4
3
2
Low
1
Extent of Use
Total,
Present Study
Total,
Van de Ven
2–4
(N=14)
5–7
(N=23)
8–10
(N=19)
11+
(N=50)
Group Size

Figure 4

Variation in the Use of Impersonal and Personal Modes of Communication Using Fiedler's Contingency Variables



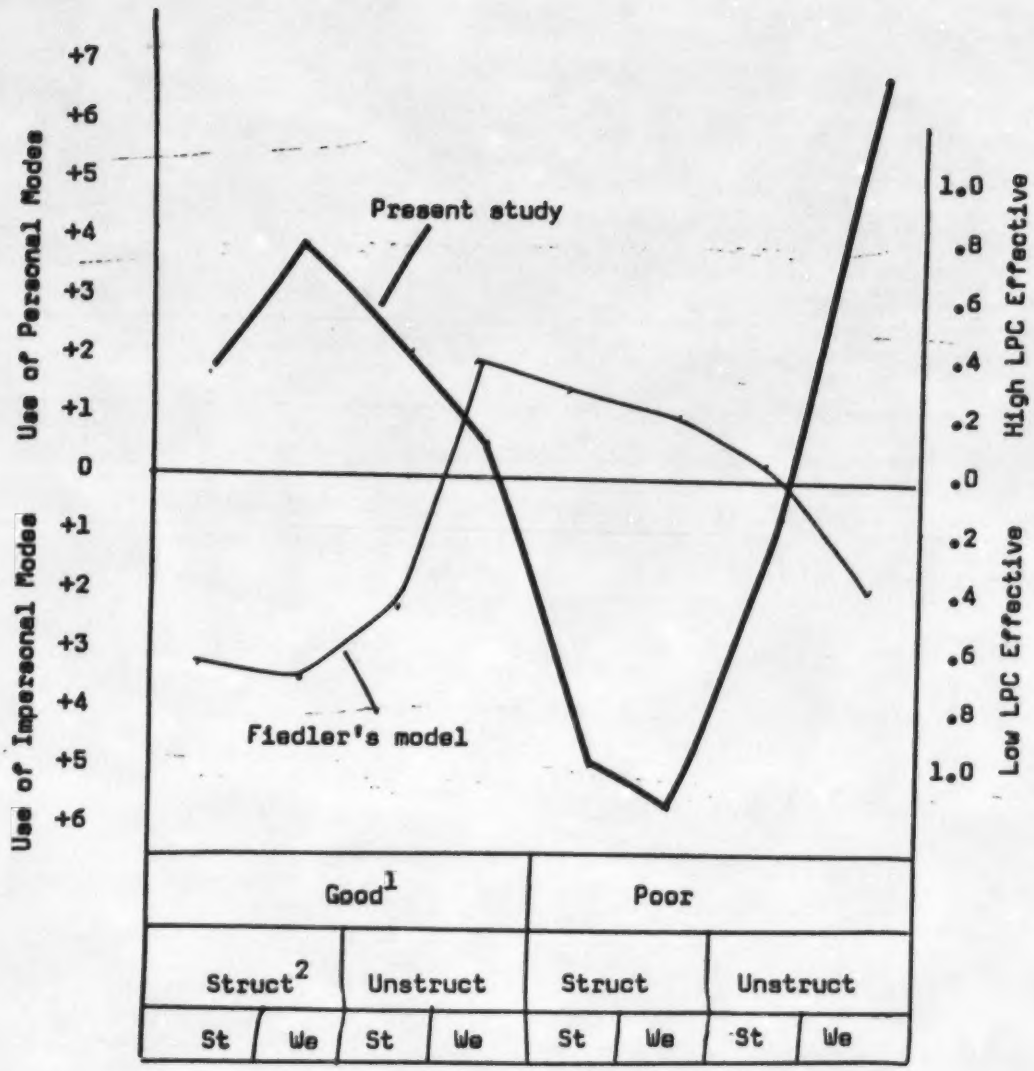
[1] Leader–member relations

[2] Task, structured or unstructured

[3] Leader position power, strong or weak

Figure 5

Comparison of the Relative Use of Impersonal and Personal Modes of Communication to Fiedler's Data on Effectiveness of High and Low LPC Leaders



[1] Leader-member relations

[2] Task, structured or unstructured

[3] Leader position power, strong or weak

Figure 6

Variation in the Use of Impersonal, Personal, and Total Modes of Communication Using Hersey and Blanchard's Member Maturity as a Contingency Variable

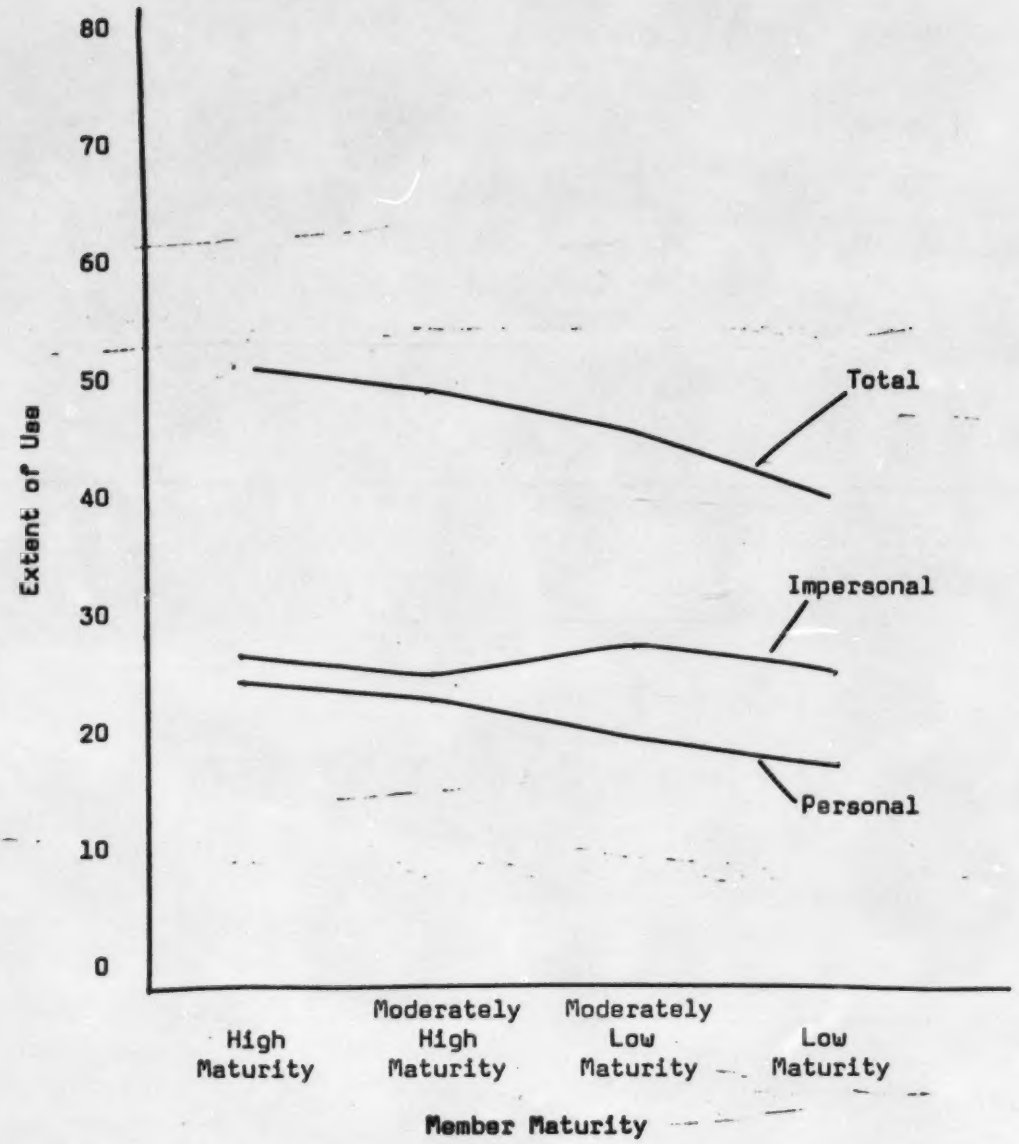
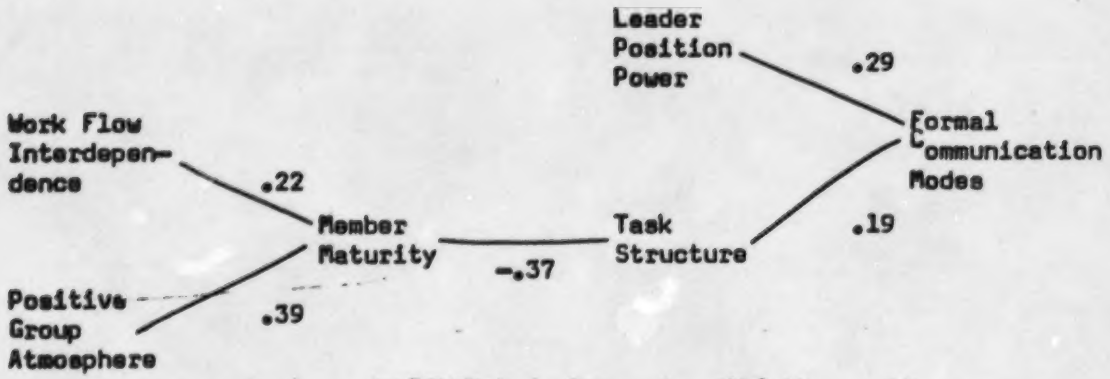
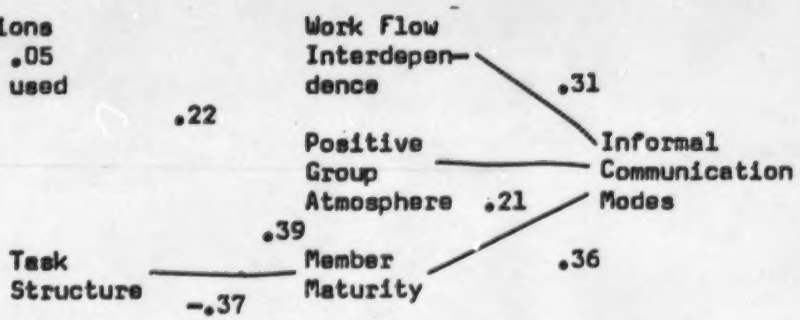

80
70
60
50
40
30
20
10
0
Extent of Use
Total
Impersonal
Personal
High Maturity
Moderately High Maturity
Moderately Low Maturity
Low Maturity
Member Maturity

Figure 7

Diagrammatic Representation of the Relationships Between the Contingency Variables and the Communication Modes in Work Groups.



Note: Correlations significant at .05 or better were used to plot these diagrams.



Note: These diagrams illustrate patterns of significant correlation between contingency and dependent variables; they are not path models.

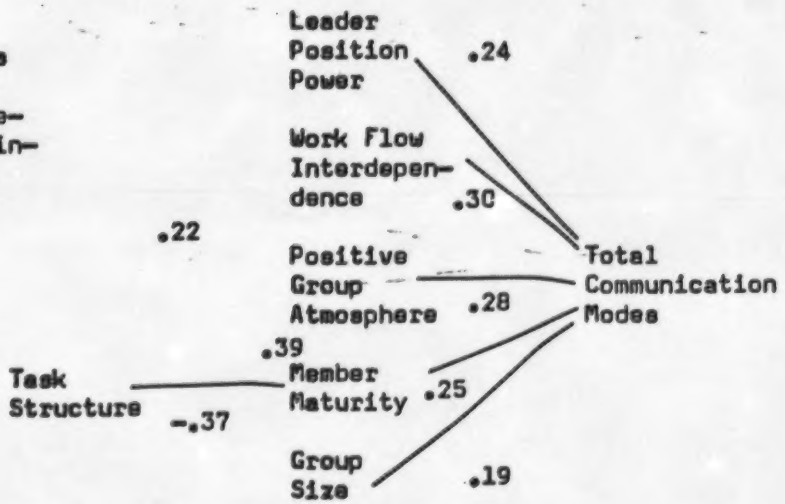


Table 1

Characteristics of the
Contingency and Dependent Variables

Variable	Source	Split Half r	Number of Factors	Skewness	Coefficient of Variation	Comments
Leader Position Power	Fiedler, modified	.60	3	-.20	26.8	
Task Structure	Van de Ven, et. al.	.36	4	-.09	28.4	
Group Atmosphere	Fiedler, modified	.89	1	.85	34.3	Skewed toward positive, warm group atmosphere.
Work Flow Interde-pendence	Van de Ven, et. al., modified	NA	NA	-.77	42.2	Skewed toward high work flow interdependence.
Group Size	Van de Ven, et. al., modified	NA	NA	2.01	78.3	Skewed toward small group size.
Member Maturity	Based on Hersey and Blanchard	.63	1	.43	36.2	
Formal Communi-cation	Van de Ven, et. al.	(See text for discussion of these variables.)		-.28	27.6	
Informal Communi-cation	Van de Ven, et. al.			.18	33.8	
Total Communi-cation	Van de Ven, et. al.			-.61	26.4	Skewed toward high total communication.

Table 2

Matrix of First Order Correlations Between Items on the Work Coordination Modes Questionnaire (only correlations significant at .05 or better are shown).

	1	2	3	4	5	6	7	8	9	Mean Rating
1. Policies and procedures		.59								6.89
2. Plans and schedules						.31		.34		6.56
3. Supervisor				.32				.29		6.53
4. Assistant supervisor										4.02
5. Informal work coordinator							.29			3.20
6. One-to-one contacts								.31		7.67
7. Standing committees								.39	.39	3.64
8. Staff meetings									.57	5.44
9. Task forces										4.93

Table 3

Multiple Regression Analysis
of Fiedler Contingency Variables
Against Communication Modes

	Leader Power		Task Structure		Group Atmosphere		Multiple R
	r	β	r	β	r	β	
Formal Communication Modes	.29[1]	.26[1]	.19[2]	.14	.12	.07	.34[1]
Informal Communication Modes	.03	.03	-.13	.16[2]	.21[2]	.23[2]	.26[1]
Total Communication Modes	.24[2]	.20[2]	.09	.04	.28[1]	.25[2]	.35[1]

1 = significant at .01 level
2 = significant at .05 level

Table 4

Multiple Regression Analysis of Six Contingency Variables Against Communication Modes

	Leader Power		Task Structure		Work Flow Inter-dependence		Group Atmosphere		Group Size		Member Maturity		Multiple R
	r	β	r	β	r	β	r	β	r	β	r	β	
Formal Communication Modes	.29[1]	.26	.19[2]	.21[3]	.13	.04	.12	.11	.15	.11	.09	.13	.40
Informal Communication Modes	.03	.01	.13	.03	.31[1]	.24[2]	.21[2]	.07	.11	.05	.36[1]	.28[2]	.44
Total Communication Modes	.24[2]	.18[2]	.09	.14	.30[1]	.23[2]	.28[2]	.14	.19[2]	.14	.25[2]	.18	.49

1 = significant at .01 level
2 = significant at .05 level
3 = significant at .10 level

Table 5

Matrix of First Order Correlations
Between Contingency Variables

	1	2	3	4	5	6
1. Leader Power		.15	.06	.14	.03	.01
2. Task Structure			-.17	.11	-.10	-.37[1]
3. Work Flow Interdependence				.15	-.14	.22[2]
4. Group Atmosphere					.04	.39[1]
5. Group Size						-.11
6. Member Maturity						

Table 6

Multiple Regression Analysis of Four Contingency Variables Against Communication Modes

	Task Structure		Group Atmosphere		Group Size		Member Maturity		Multiple R
	r	β	r	β	r	β	r	β	
Formal Communication Modes	.19[2]	.23[2]	.12	.04	.15	.11	.09	.15	.28[1]
Informal Communication Modes	.04	.03	.21[2]	.10	.11	.08	.36[1]	.30[1]	.38[1]
Total Communication Modes	.09	.13	.28[1]	.19[3]	.19[2]	.17[3]	.25[1]	.20[3]	.39[1]

1 = significant at .01 level
2 = significant at .05 level
3 = significant at .10 level